



# The Ground Plane

SOUTH BAY  
AMATEUR RADIO  
ASSOCIATION /  
ARRL MEMBER CLUB  
SINCE 1974



Volume 1 Edition 5

May, 2000

## Ham Trivia Questions

What is the National calling frequency while operating on 146 Mhz FM?

After installing a Tower for Amateur Radio Communications, when is a "warning" light required?

Who were two of the original manufacturers of Amateur Radio "kits?" And what were their names?

When constructing a Dipole Antenna for 20 Meters, (in free-space) what is the formula to determine the length?

Answers to April Questions included in this issue.

## President's Message

by rudi wiedemann - kf6rlq

With Field Day fast approaching, I was thinking about how SBARA can make this event more fun and interesting for everyone. In response, the Leadership Team 2000 came up with a great idea. Let's have 'exhibit tables' at the entrance to the

Call for more  
Field Day  
Active  
Participation

event grounds, like a **Ham Radio Expo**. We'll hold hands-on demonstrations of as many different aspects of ham radio as possible.

Each table will be staffed by an expert in that area, so you can ask questions and get some great tips from the pros! So far we've got **T-hunting**, **Packet** and **APRS**

represented.

We'd also like to have Satellite, Solar/QRP, and any other topic related to interactive ham radio operation.

We're also planning on tables representing other related community groups such as **ARES** and **CERT**. Besides that there will be a couple of '**Tinkers N Traders**' tables available for you to bring your favorite projects or stuff to sell/trade. (NOTE: if you haul stuff in, it's your responsibility to get it hauled out again.)

We'd like to have as many people present and participate in these table activities as possible. So if you're interested in exhibiting or helping work a table, please contact Field Day Coordinator Alan Kittrell, KE6YKK.

## May Program - Globalstar "Leo"

Nils Holmes (N1LS) of Globalstar will be describing the Globalstar LEO (Low Earth Orbit) satellite phone service. This presentation will give a real life application of satellites in communica-

tions giving a glimpse of what the future has in store for us. Mark your calendar for May 17<sup>th</sup> to come and hear Nils Holmes.



### This Month in the SBARA GroundPlane

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# Paul Carlin KE6NVU, To Be Guest Speaker At A Special Saturday Workshop

by syd - w6qwk

On Saturday, May 20 from 2:00 to 4:00 Tri-Cities hams will host Paul Carlin who plans to present an important and timely program for hams, old and new. The meeting will take place at the Community Center at Central Park and will last for about 2 hours. The reason for the afternoon schedule is that is the only time that was available, according to Al Rendon-WT6K and the park rangers.. SBARA is the official sponsor for the event but all hams in the area are more than welcome. This includes those of you that come out of the CERT ranks that had such a successful emergency drill on Saturday,

April 29.(Well done to all hands including the CERT hams, Mike Fung-AWI, Ray-OGM and Jim-IVA).

Paul plans on having a number of demonstrations, all related to emergency communications. These include the erection of a jungle tower supporting a dual band antenna. Paul and his Section Staff have developed the concept of using portable repeaters to fill the voids created by permanent repeaters. They recently fine-tuned their procedure at the last month's Baker-to-Vegas event which brought about a first place win for the Fremont PD. (Agreed, the runners contributed, too.) Year before last the PRIMAVERA bike event employed two of the portable repeaters using the help of Paul-NVU, Wayland-UOK, Jim-IVA, Bill-IMS and Andy-CJK. At the May 20 session Paul will demonstrate the setting up and use of one of these repeaters.

Instead of voice transmissions Paul plans on using data exchange using packet radio. This mode is perfect for handling emergency traffic as was seen at the recent drill, April 29. We can also expect to Paul is a dynamic speaker and a fun guy to listen to. He and his staff work mighty hard to get us prepared to deal with the consequences of the Hayward fault breaking.

Please turn out for this very special event.

MAN it was tough getting going at o'dark hundred without at least the benefits if a Starbuck's. But by 0600 we found others at the Logan High School parking lot setting up the tables, radios and whatnot for the annual Primavera Century Bike Ride sponsored by the Fremont Freewheelers Club, and supported by SBARA.

54 Hams Support  
Primavera 2000  
by rudi wiedemann - KF6RLQ

The first shift of the Net Control had become operational at 0700 and the 12 'SAG wagons' were already starting to check-in. These bicycle club member vehicles staffed with ham radio operators to provide rider support in the field. They typically provide water, replacement tire tubes, pump ups, and covey rider messages and requests. Net control had 12 persons covering 2 shifts, one from 0700 to 1200, and then till 1700.

In addition, rest stops at Meyers Park Ed Levin Park, Milpitas and Lafayette were each staffed by several hams to coordinate supplies. There were 4 'shadows' with the job of following key event coordinators around to ensure good flow of information. There were also 2 supervisors and 1 reserve supervisor.

A total of 54 hams participated, which is quite remarkable since the annual Baker-to-Vegas event was held the same weekend, drawing a large contingent of local hams to support them. With much of the normal portable repeater equipment down south, we had to get creative on how to cover the 'radio holes' around the hilly areas of the course from Alamo to Moraga. Doug Campbell hit on the idea of using a beam to bounce a 440Mhz signal off the Peninsula hills and link to the Diablo repeater, which is visible from over there. Amazingly it worked like a charm!

## "T" Hunting with Syd !

Did you  
manage to  
find the  
"FOX?"

There were two hidden fox'es and the hunting ground was the vastness of Fremont's Lake Elizabeth. One "fox" was a full-time transmitter and the other was a half-duty transmitter.

Everyone learned a new skill and everyone had a good time looking for that pesky little "FOX." Thanks Syd for providing and guiding the membership.

Get ready, plans are being made, equipment is being readied, and once again SBARA will transform a corner of Central Park into Heaven for Hams. June 24 is the big day for the annual ARRL field day and operating 'contest'.

Weeks of preparation will go into high gear early Saturday morning when the hardy souls of our set up team will start putting up antennas, tents, operating stations, logging computers, and portable generators to run it all. Coffee and doughnuts will get the crew going as excitement builds toward start time. Field day is a tradition more than a contest. The reason for doing field day is preparation. Field day is the ideal way to make sure that the ability to establish working communications is there. Twenty four hours to set up multiple operating stations, log as many contacts as possible, and take everything away again. That's the challenge of Field Day.

SBARA Field Day is a special chance for everyone to pitch in, try something new, experiment with that newest piece of equipment. Field Day stations are operated as extra class with visiting operators allowed. This means you can try out any mode of operating that we have available, and we will cover pretty much everything. That's right, you can be 'guest operator' of eight or ten rigs in one day! Now who could pass up an opportunity like that?

This year we will be providing space for guests from ham related groups and special interests. We will have displays and table top presentations featuring T-hunting, Emergency Services (ARES / RACES), Low Power (QRP) Radio, and alternate power systems (Solar). Fremont CERT will be on hand to explain the rapidly growing system of Community

## Field Day 2000 is just around the corner

Emergency Response Teams.

If you have anything special you would like to present, please get in touch, we want to present the many aspects of Ham Radio.

Daylight operating should be really good this year, the sun is finally cooperating, so there should be plenty of excitement, lots of distant contests, and a chance to experience the fun of Ham Radio beyond repeater range. You are going to upgrade this year, aren't you?

Make sure you bring the family, there's plenty of room for the kids to roam, a years worth of news to catch up on, and the best pot luck and barbecue you are likely to get invited to. Lawn chairs are perfect, bring your own and maybe a light jacket in case you get comfortable! We plan to make young hams and like to be hams especially welcome so it's a great time to invite a friend or neighbor to try out ham radio.

We still have plenty of jobs left, if you apply early you can have your choice, if you wait, well.....See you all on field day, and when one of our committee people asks for your participation just say YES! It's too much fun to pass up.

'YKK

### BECOME A HAMBASSADOR

Do you have kids in school? Do you know someone in a retirement community? How about a long-distance truck driver? Or senior citizens who travel in their RV? Maybe you belong to another local community services organization? Here's your chance to spread the word about SBARA and ham radio in general. With your help, the Club can arrange for a 'show and tell' for your group. Please contact Rudi Wiedemann, Public Information Officer.

# Club Officer Reports

## Secretaries Report

by rudi wiedemann

(stand-in for Elise - KF6TQB)

The meeting was called to order by Rudi Wiedemann (KF6RLQ) at 1930 hours. Attendee introductions were made all around and there were 2 visitors.

An announcement was made that the April GroundPlane was available at the back of the room and on the website.

The annual Primavera and Baker-to-Vegas events were briefly described. This year was unusual since both events fell on the same weekend, splitting the people and equipment available to support them.

The topic for the May meeting is Low-Earth Orbiting satellites (LEOS) and the workshop will be on Emergency Communications by Paul Carlin from 2pm-4pm on Saturday May 20.

The President announced the "Tinkers N Traders" table as a new concept for the monthly meeting. The idea is for members and visitors to bring their favorite project or item for sale, especially if it's related to the topic of the month.

A snack break hosted by Helen Wiedemann(KF6ZYB) was held from 2000 to 2015.

Then Syd Furman (W6QWK) presented the basics of the Transmitter Hunting with the help of Don Safer (KC6IPO). He then turned everyone loose on the 'easy' and 'difficult' hidden transmitters planted earlier around Lake Elizabeth. Many found the 'easy' transmitter, but when they got to the difficult one they all stood around NEAR the location but still couldn't find it. Turns out Syd hid it under a hallowed-out treestump, and used nearby red toolbox with an antenna on it as bait just to throw us off! We all had a great time of it, and look forward to real T-Hunts in the future.

The meeting was adjourned after the T-Hunt at 2130.

## Treasurer's Report

by Ted - N6BFO

Total cash assets 3/31/2000:

\$3053.13

Income since then: \$74.97

Expenses: \$113.47

Current balance 4/27/2000:

\$3014.63

Projected for May: Income: \$60.00,

Expenses: \$150.00.

## Name Badges

by Jim - KE6IVA

Any SBARA member who would like to obtain

a Name Badge for Field day can do so by contacting Jim Wood.

The Badges are \$8.00 each and include both a pin and a clip for attaching to a shirt, blouse or jacket.

Jim Wood

KE6IVA

510-657-6234

42640 Palm Ave.

Fremont, CA 94539

jimjoann@pacbell.net

SBARA Board Meetings on Tuesdays Before the General Club Meetings. Please Plan on Attending.... 7:30PM see rudi - KF6RLQ for details.

# Fremont Communications Volunteer Meeting Minutes

by robin ney - kg6di

**I.** The meeting began at 1938 hours at the Fremont Police Department. Present were Ray Wong (KE6OGM), Jim Wood (KE6IVA), Steve Bassett (KQ6VH), Joann Wood (WV6RQT), Mike Fung (WA6AWI) and Wayland Louie (KB6UOK).

**II. Program:** The night's program was a review of the current Police and Fire Station locations in the Tri-City area. A hand-out was distributed with the information, which will need update when the Union City Fire Department officially reopens. Mike Fung agreed to e-mail the attendees a listing of the Fremont School District antenna drops.

### **III. Agency Reports:**

- 1) Alameda County District-The next County Emergency Coordinator meeting is as yet unscheduled. More information to follow.
- 2) CERT Teams—A citywide drill is scheduled for April 29, 2000. Anyone interested in passing Net traffic on behalf of the CERT Amateur Radio Teams is encouraged to contact Mike Fung (WA6AWI). The drill is scheduled to run from 9:00 a.m. to 12:00 p.m., with a debrief at 1:00 p.m.
- 3) Fire Dept. - Acting Division Chief Valdes will provide training at the May meeting.
- 4) Hospitals - Jim Wood checked into the Hospital Net on April 26 from Kaiser Fremont. The annual May Hospital drill has been moved to November.
- 5) Police Department —No report was given.
- 6) Red Cross — No report was given.
- 7) Schools — No report was given.

### **IV. Old Business:**

- 1) Volunteer Time Reporting — The Disaster Service Worker registration submission deadline has passed. If you did not submit a form, contact Janet Valdes at 790-6691 for another copy. A reminder that the 7<sup>th</sup> of each month is the deadline for prior month volunteer hours was made. To submit hours, you may call Janet or e-mail her ([JValdes@ci.fremont.ca.us](mailto:JValdes@ci.fremont.ca.us)), or submit a timesheet if you have one. Hours submitted after the 7<sup>th</sup> will not be accepted.
- 2) Net Control Duties - Fremont is responsible for May 2000 Net duties. If you would like to operate the station at the Fremont Police Department, contact Wayland Louie or Jim Wood. Jim volunteered to run the Net on May 2 and Mike Fung will coordinate the May 9 Net.
- 3) Radio room - Thanks to Paul Carlin, Mike Fung (WA6AWI) and Jim Wood for reassembling the ham positions at the Police Department. Packet capabilities have not been reestablished, but Mike Fung will complete that task for the April 29 CERT drill. Jim Wood has been escorting hams to operate the radio during the Tuesday night Nets, so contact him to run the Net from there.

4) Telephone Tree - Jim Wood and Mike Fung have volunteered to assist Andy Mascsak (WD6CJK) in completing the telephone tree.

5) Baker to Vegas 2000 - This year's race was a success. Team Fremont achieved a top 10 finish (first in their division by more than an hour) and the radio network was better than ever. The APRS coverage was excellent and more holes were filled on the voice network. Plans are already underway to improve next year's coverage.

6) Primavera 2000 - The Primavera 2000 bicycle tour was also a success, according to Doug Campbell (WB6GBE). Doug stopped by before the meeting to return the Go-Box, which was used at Primavera.

### **V. New Business:**

- 1) Radio training opportunities - April 29 is the first of a number of opportunities to learn or hone radio skills. Another training session will be held on May 20, 2000 at the Community Center.
- 2) Field Day 2000 - Jim Wood announced that a permit has been secured to use Central Park for this year's event, on June 24 and 25.
- 3) May training - As mentioned earlier, Mike Fung has arranged for Acting Fire Division Chief Valdes to provide training on the state Resource Information Management System (RIMS) at the next Communication Volunteer meeting.

### **VI. Events:**

- 1) SBARA Meeting - May 17, 2000 at the Central Park Community Center.
- 2) Emergency Communication Training - May 20, 2000 at the Central Park Community Center.
- 3) Communication Volunteer Meeting - May 24, 2000.

### **VII. Adjournment:**

The meeting adjourned at 2108 hours. The next meeting is scheduled for 7:30 pm. On May 24, 2000 at a place to be determined. For more details on any of the items mentioned above, as well as the May meeting location, tune into the weekly 147.015 Tuesday night Net at 7:30 pm. Ask for details if none of the topics are discussed, or put out a request for more information.



# BAKER TO VEGAS 2000

by Jim Wood KE6IVA

Nearly 40 bay area hams participated and helped in the B2V2000 effort this year. They provided voice and data communications for the Fremont Police Department's annual "120 Mile Challenge Cup Relay Race".

The Bay Area Communication Team started in January with work parties and borrowing ham radio gear along with GPS equipment. They built four remote repeater stations, 10 vehicle tracker boxes and two net control stations. The system was both voice and data which covered a 120 mile area; going from Baker California, through the Mojave desert, over Ibex Pass extending into Shoshone, going thru Pahrump, over Mountain Springs Pass, and extending into Las Vegas, Nevada.

An advance team of 13 went down a week early to set up all the equipment; three repeater sites on mountain passes along with a desert site. Two net control stations were added at Las Vegas and at Pahrump. GPS and radio Tracker Boxes were installed into one follow van, four shuttle vans, three personnel vehicles and two IC equipment trucks. Twenty additional hams caravanned down Friday before the race to staff the positions for this large undertaking. Our Fremont Team started at 9:00 pm and finished in 14 hours 31 minutes and 55 seconds. They took first place in their division, beating second place Pasadena by over one hour and were 10th overall of 195 entrants.

The system gave voice communications over a sixty to seventy square mile area and instant messages to the follow van and shuttle vehicles. The data system kept track of all vehicles and the location of the Fremont runner along the course who was mapped at Pahrump and also at Las Vegas. The Fremont PD race headquarters was in Pahrump and they were excited to get updates of the progress of the race along with passing and receiving information from and to their support vehicles. The system also allowed tracking the competition and passing this information to the follow van and logistics.

The Fremont Police Department thanks SBARA, ARES, Communication Volunteers and all the Bay Area Hams who helped with this event including those from Chicago and Branston, Mo.

# Local Hams Help Make CERT Drill a Success

By Doug Stinson – KG6ADR

Hams take pride in using their hobby to provide public service. In particular, Amateur Radio has a long and distinguished history of providing communications after earthquakes, hurricanes and other natural disasters. ARES and RACES are organizations within the ham community that specialize in emergency communications.

Recently, local hams had another opportunity to show-off their public spirit and emergency communications skills. On Saturday, April 29, 2000 at 9:00 AM, 160 volunteer members of CERT, including 29 hams, responded to a simulated magnitude 8.0 earthquake striking Fremont and Union City.

CERT, short for Community Emergency Response Team, is based on the assumption that a widespread emergency will isolate neighborhoods and overtax professional service providers such as the fire department. Everyone should have sufficient training so as not become a victim themselves, and then to organize their neighborhood to cope with the aftermath of the disaster.

At the start of the drill volunteers reported to one of eight staging areas, located in each of the Alvarado, Ardenwood, Centerville, Decoto, Irvington, Mission San Jose, Niles, and Warm Springs districts of Fremont and Union City. As they arrived they had to organize themselves to deal with various scenarios cooked up by the CERT District Coordinator. Teams were faced with simulated collapsed buildings, over-turned tanker trucks, derailed trains, toxic gas releases, and fires of various intensities and extents.

This drill, with teams spread over the entire 100 square miles of Fremont and Union City, was the first realistic test of CERT communications. Consistent with the cities' disaster preparedness plans, ARES set up a net control operation in the radio room of the Fremont Police Department, close to the Police Department's Field Operation Center (FOC). This directed net, controlled by Jim Wood (KE6IVA), provided voice communications between districts and with city officials. Because CERT generally is involved with search and rescue activities, most of its traffic is directed to the Fire Department.

# Local Hams Help Make CERT Drill a Success

By Doug Stinson – KG6ADR

To handle this, ARES established a packet radio connection between the Police FOC and the Fire Department FOC. Mike Fung (WA6AWI) manned the terminal at the Police Department, while Ray Wong (KE6OGM) and Syd Furman (W6QWK) staffed the packet station at Fire FOC.

Meanwhile, each district had to establish its own communications procedures. The resources (people and equipment) as well as the nature of the incidents determined the exact structure of each district's communications organization.

For communication resources, the districts could draw on members of the CERT Amateur Radio Team (CART). CART is a semi-informal organization of people who have passed CERT training and have their Amateur Radio License. ARES supports CART by assisting in providing additional training in emergency communications to CART members. A training team consisting of Mike Fung, Ray Wong, Joe Peterson (KE6YHG), Nancy Peterson (KF6HOI), Brian Krause (KF6ZGC) and David Ward (VE7DWJ) put in many hours developing and delivering a series of classes tailored to CERT communications procedures. Some districts also pulled in "future CERT" hams to help staff their operations.

All districts appointed a ham radio operator from their ranks to exchange messages between the district's Incident Command Post and net control. Most districts also had a second ham running a sub-net for communication between the command post and the district's search and rescue teams, for those teams equipped with ham radios. The Irvington, Niles and Mission San Jose districts ran sub-nets based on Family Service Radio, as well. In Ardenwood, Florence Wong (KF6GAH) experimented with a packet connection to net control.

By all accounts, the drill was a resounding success. Members of search and rescue teams reported that the addition of radio communications to their teams significantly increased their effectiveness. Fire Department officials commented on the quality of the effort by all participants, but particularly those involved in communication. The fact that requests and status reports from the districts

were received by packet radio, printed in triplicate, and delivered to the Fire Department's FOC added a certain patina of professionalism to the proceedings!

One of the purposes of drills such as this is to uncover problems and learn from mistakes.

In this the drill was also a success!

Since all districts shared the same 2 meter frequency for within-district communications, obeying common rules, such as using the lowest power required for reliable contact, were reinforced. In spite of the potential conflicts of a common frequency, reports were that everyone was "well behaved".

Net control operated primarily on the WA6PWW repeater, although a test was conducted using simplex. This resulted in one of the big surprises of the day: net control, with an antenna on the police department's tower, was the weakest station heard! This was tracked down to an incorrectly wired duplexer, which was subsequently repaired. Inter-district simplex communication was otherwise remarkably good, however it is clear that for reliable simplex operation, each district needs field-deployable antennas to supplement the ubiquitous "rubber ducky".

It also became clear that, for effective communications, other members of the district incident command post staff, besides the radio staff, need training in emergency communications procedures. In fact, one important roll hams can play is to provide impromptu "just-in-time" training to other CERT team members.

However, the most important lesson learned was that having trained radio operators integrated into the CERT teams, and having excellent cooperation between the various segments of the ham community will greatly improve our chances of surviving the next "big one".

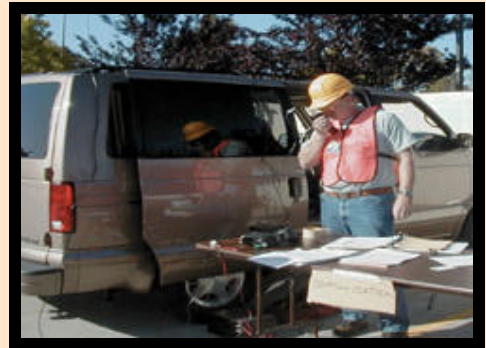
# Local Hams Help Make CERT Drill a Success

By Doug Stinson – KG6ADR

## CERT Photographs April 29, 2000



Ken Thomas, KF6ZGH, Warm Springs District Communications Coordinator, maintains contact with net control from the district incident command post.



Jim Wood, KE6IVA, prepares for net control operations while Ray Wong, KE6OGM, assists.



Mike Fung, WA6AWI, operated the Police Department end of a packet radio connection to the Fremont/Union City Fire Department.



## SBARA 2000 Meeting Program and Workshop Schedule

Month	Meeting Program	Workshop
January	BUILDING A PORTABLE EMERGENCY GROUND PLANE ANTENNA DATE: JANUARY 19 <sup>th</sup> TIME: 7:30PM LOC: COMMUNITY CTR	NEW HAM ORIENTATION CLINIC DATE: JANUARY 26 <sup>th</sup> TIME: 9:00AM LOC: HICKORY PIT RESTAURANT
February	STANFORD SATELLITE PROGRAM- PROFESSOR ROBERT TWIGGS DATE: FEBRUARY 16 <sup>th</sup> TIME: 7:30PM LOC: COMMUNITY CTR	BUILDING YOUR OWN PORTABLE GROUND PLANE ANTENNA DATE: FEBRUARY 26 <sup>th</sup> TIME: 9:30AM TO NOON LOC: COMMUNITY CTR
March	AUTOMATIC POSITION REPORTING SYSTEM (APRS) – PAUL CARLIN KE6NVU DATE: MARCH 15 <sup>th</sup> TIME: 7:30PM LOC: COMMUNITY CTR	HRO SUNNYVALE WORKSHOP DATE: MARCH 25 <sup>TH</sup> TIME: 8:30AM LOC: HRO SUNNYVALE
April	INTRODUCTION TO TRANSMITTER HUNTING – SYD FURMAN W6QWK DATE: APRIL 19 <sup>th</sup> TIME: 7:30PM LOC: COMMUNITY CTR	None currently scheduled.  WORKSHOP at Hickory Pit. No date set.
May	GLOBALSTAR (LEO SATELLITE PHONE SERVICE) – NILS HOLMES N1LS DATE: MAY 17 <sup>th</sup> TIME: 7:30PM LOC: COMMUNITY CTR	EMERGENCY COMMUNICATIONS WORKSHOP – KE6NVU DATE: MAY 20 <sup>th</sup> TIME: 2:00PM TO 4:00PM LOC: COMMUNITY CTR
June	FIELD DAY TUTORIAL, LOGING, OPER- ATING AND SETUP – ALAN KE6YYK DATE: JUNE 21 <sup>st</sup> TIME: 7:30PM LOC: COMMUNITY CTR	SBARA FIELD DAY 2000 DATE: JUNE 24 – 25 <sup>TH</sup> TIME: START 24 <sup>TH</sup> 7:00AM POTLUCK DINNER 5:00PM LOC: LAKE ELIZABETH
July	RON ROSS'S TRIP TO ANARTICA WITH HIS AMATEUR RADIO WEATHER STA- TION. DATE: JULY 19 <sup>TH</sup> TIME: 7:30PM LOC: COMMUNITY CTR	None currently scheduled.
August		None currently scheduled.
September		None currently scheduled.
October		None currently scheduled.
November		None currently scheduled.
December	NO MEETING IN DECEMBER	CHRISTMAS

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**(800) 854-6046**  
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I-880 at 23rd Ave. ramp

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Toll free, incl. Hawaii, Alaska, Canada; call routed to nearest store; all HRO 800-lines can assist you, if the first line you call is busy, you may call another.

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## Answers to April Trivia Questions....

What are the upper and lower  
ends of 20 Meters for General  
Class License holders? **14.225 -  
14.350 Mhz.**

What is the Maximum Output  
Power on 30 Meters? **200 Watts.**

What is the National Calling  
Frequency on 144Mhz SSB or  
CW? **144.200 Mhz.**

To successfully obtain a Gen-  
eral, or Extra Class license,  
What is the "required" Code  
Speed in

WPM  
effective  
4/15/200  
O? **5  
WPM**

**On The Bands...**  
Work any interest-  
ing contacts on the  
Low Bands?

## **The Ground Plane**

South Bay Amateur Radio Association -  
SBARA  
P.O. Box 8377 The Ground Plane  
May - 2000 Newsletter  
P.O. Box 8377